"Borrowing money costs money": Yes, but why not tell how much?

Philip Hans Franses
Anita Vlam

Econometric Institute
Erasmus School of Economics

Econometric Institute Report 2011-02

Abstract

Consumers have substantial debts. Examples concern mortgages but also debts for products such as clothing and books. Facing difficulties when dealing with interest rates and percentages computations is one of the reasons for those debts. Campaigns like "Borrowing money costs money" should make consumers aware of the consequences of borrowing money. We argue that the campaign would be more effective if the actual size of the debt is mentioned in monetary terms. We support our argument using experimental data.

This version: January 2011

We thank Christiaan Heij for his help with collecting the data.

Address for correspondence: Econometric Institute, Erasmus School of Economics, PO Box 1738, NL-3000 DR Rotterdam, The Netherlands, franses@ese.eur.nl

1. Introduction and motivation

Consumers in industrialized countries often have credit debts. There is a large literature on the potential sources of those debts, see for example Lusardi and Mitchell (2008) and the literature cited therein. One aspect that has gained attention recently concerns the concept of financial literacy, of which a sub-aspect concerns the ability of consumers to perform basic and relevant computations.

Indeed, one of the potential sources over over-indebtedness is the notion that consumers face difficulties performing the actual calculations when they decide to purchase on credit. For example, consumers may find it hard to compute what the exact final amount is when they have to pay off a loan of 10000 Euros with a 0.6% interest rate per month over 72 months. In Franses and Vlam (2011) it was demonstrated that consumers not only lack the skills to perform these tasks, they also show a tendency to underestimate the eventual debt size. Similarly, subjects in the experiments were found to believe that debts are paid off earlier than that they really are.

To warn consumers of consequences of borrowing money and against too high a debt, in the Netherlands a campaign has been initiated to increase awareness. The tag line in the Dutch situation is "Borrowing money costs money"[1]. Despite its apparent success in creating such awareness, we believe that this campaign could be made even more effective if the money lender would be forced to precisely say how large exactly these borrowing costs are. Exact information about the total amount paid instead of information in monthly terms (and in small print) should make people more aware of the total costs of the loan. Hence, one would then read for example that a television set costs 338 Euros, but if a consumer decides to borrow the money and pay back in monthly terms, the costs could increase to 384 Euros, say.

In the present paper we put this conjecture to a simple empirical test. We run two rounds of experiments, with the first where consumers face payment options that also involve buying on credit and where the second rounds only concerns monetary amounts. Our experiments show a clear support for the conjecture, and hence we conclude that we recommend money lenders to precisely quote the debt size in Euros.

[1] http://www.afm.nl/en/professionals/afm-actueel/nieuws/2009/dec/kredietwaarschuwingszin-succes.aspx

2. Research design

The research design is based on the familiar and rather basic version of a conjoint experiment. We ask individuals to choose between two choice options. Each choice option involves values for attributes and also for the method of payment. We have two runs of our experiments. First, we issue the survey where the payment options involve cash payments as well as payments in monthly terms (with interest). We do not create additional difficulties by forcing people to calculate with percentages, so we simply let people evaluate, say, a cash price of 338 Euros against 59 monthly payments of 8 Euros. In the second run of our experiments we simply translate the first-round credit payments into the actual monetary value, that is, following the same example, it then becomes 338 Euros versus 472 Euros.

An example of the survey is given in the Appendix, where we give the questions for hypothetical LCD television sets. We spent substantial time to make sure that the hypothetical products looked realistic. This also involves the payment amounts. Indeed, large screen sizes and more Hertz should also come with higher prices. So, whereas Brand, Screen Size and Hertz only have two levels per attribute, the payment seems to have many more. A closer look reveals that for the prices there are effectively three levels, the first is cash, the second is 24 months with some amount per month and the third is the maximum number of months with a somewhat smaller amount per month. We tested the survey on a few sample individuals and we consulted internet retail stores selling those television sets to confirm that these hypothetical products actually make sense.

A similar research design was implemented for couches. We chose this second product as we were about to hold the survey amongst undergraduate students at the Erasmus School of Economics. Some prior experimentation learned that these two products were actually considered by students, where also the three different levels of payment methods were considered as realistic. Additional to the indicated choices, we also asked to reveal their gender, age and income level.

On the first day of data collection, November 8 2010, we surveyed 375 students, which thus results in 4500 (is 375 times 12) answers of which 2250 are 1 for “preferred” and 0 for “not preferred”. On the second day, November 25 2010, we surveyed 285

students giving 1710 values of 1 and 1710 of 0. The students were following different bachelor courses, so there is no overlap between the individuals in the two samples.

The data are analyzed by the familiar binary logit model, where the explanatory variables take values of 1 or 0, where 1 denotes the occurrence of that particular level. As the payments can take three levels, each time we consider two logit models, each with a pair of potential levels of payment.

What would we expect a priori from the experiments? First, we would see that cash payments would be preferred over credit payments. So, we would expect that consumers would prefer to pay 338 Euros over payments in 24 months (which is 384 Euros). Second, we would expect that when the actual monetary amounts are given (in the second round of experiments), the differences in preferences would become even larger. We have two settings, one concerns the prices 338, 384 and 472 and the other is 439, 504 and 657. Clearly, the differences between the first two is much smaller than between the first and the last, so we would expect that most prominent differences in preferences would appear for the cash price versus payments during the maximum amount of months.

3. Results

In this section we first present the results for the survey concerning LCD television sets, and next we see if these results are corroborated by the results for the couches.

3.1 Results for LCD television sets

The estimation results for the two logit models for LCD television sets appear in Table 1. Students appear to favor LG, Screen size 94 and Hertz 50, as their associated parameters usually take a positive and significant value. Payment in 24 months is less preferred over cash and payments in the maximum amount of months are even less preferred, which can be seen from a comparison of the absolute values of the parameter estimates. When we compare the results for November 8 versus November 25 0f 2010, we see differences

across the parameters, but, as these estimates are correlated, we resort to an alternative method to highlight the differences across the results for the 8 and 25 November surveys.

Table 2 gives the estimated probabilities from the logit model for the cases where the LCD television sets are of the type “LG, Screen size 94 and Hertz 50”, across the three levels of prices. The probability of purchasing this product using cash money is 0.915 while it reduces to 0.850 when one can pay using a 24 month period. This is not a very large difference, that is 0.065, and also for the 25 November survey, where the respective probabilities are 0.836 and 0.791, the difference 0.045 is not large. However, matters change dramatically for the comparison of cash payments with payments during the maximum amount of months. The purchase probability now reduces from 0.949 to 0.313 (is a 0.636 reduction) when only monthly terms are used, and it reduces from 0.947 to 0.211 (is a 0.736 reduction) when actual monetary values are mentioned. Comparing 0.313 to 0.211 entails about a 30% reduction of probability of purchase.

3.2 Robustness checks

So far, we relied on a logit model where are individuals were analyzed jointly. When we estimate the parameters of the same models for males and females separately, we do not find any noteworthy differences for the numbers in the current Table 2. The same holds when we consider the models for younger and older students and for different income levels. Hence, at least for these samples, we find that demographics do not matter much for purchase preferences related to payment methods.

To see if the results in Table 2 are robust, we had a second product evaluated, parallel to the television sets, and this concerned couches. Couches could be beige or gray, have seat size 45 or 46 and have normal or special comfort, and again, three levels of payment (methods). The key results appear in Table 3. Again we see not very large differences between cash and 24 months (from 0.761 to 0.685 in the first experiment and from 0.741 to 0.726 in the second). But, like in Table 2, the differences in preferences become salient when we evaluate cash payments against the maximum amount of months. There the reduction in preferences is from 0.271 to 0.146, which is about 50%.

4. Conclusion

We conjectured that actually mentioning the price that one has to pay would make consumers less prone to opt for credit payments. More precise, when one would have consumers to evaluate a cash price of 338 Euros versus 472 Euros we would expect less preferences for the 472 Euros product then when one would have consumers evaluate 338 Euros against 59 months with only 8 Euros per month. Our experiments show that this happens indeed. In fact, the reduction in the preference ranges somewhere around 30% to 50%.

So, our recommendation is rather straightforward. We recommend the tag line "Borrowing money costs money" needs additional text, like the following: "When you purchase this television set it costs you 338 Euros if you pay with cash and it costs you 472 Euros when you pay 8 Euros per month in 59 monthly terms". Hence, we recommend product offerings to consist of not only the amount in cash but also of the total amount paid when you pay in terms.

Our research in this paper can be extended in various directions. In our study we actually included rather basic computations for the subjects. Indeed, consumers only had to multiply 59 with 8 to get the 472 Euros. In more realistic settings, consumers face statements like "0.6% interest per month for 59 months" and have to compute the 8 Euros themselves, or alternatively, have to compute the number of months. A second issue concerns the products themselves. After 24 months one may expect that, say, the television still works, but perhaps after 59 months, or earlier, one needs to buy a new one. Hence, experiments could somehow include a deterioration of quality. Finally, we considered hypothetical products, and it would thus be even more interesting to see how our findings translate to natural experiments, where consumers may evaluate actual products on actual websites.

Table 1: Estimation results for LCD television sets (all data 4500 and 3420 analyzed)

Variable	Estimate (standard error)	Estimate (standard error)
	Survey of 8 November 2010	Survey of 25 November 2010
Intercept	-1.733 (0.111)	-1.331 (0.109)
LG (not Samsung)	0.994 (0.132)	0.648 (0.124)
Screen 94 (not 81)	0.661 (0.145)	0.749 (0.132)
Hertz 50 (not 60)	2.453 (0.105)	1.563 (0.098)
24 months (not cash)	***-0.641 (0.095)***	***-0.299 (0.089)***
McFadden R-squared	0.301	0.156
Intercept	0.788 (0.159)	1.321 (0.174)
LG (not Samsung)	-0.163 (0.152)	0.224 (0.168)
Screen 94 (not 81)	1.223 (0.164)	1.934 (0.178)
Hertz 50 (not 60)	1.069 (0.109)	-0.589 (0.129)
Maximum months (not cash)	***-3.706 (0.121)***	***-4.211 (0.135)***
McFadden R-squared	0.514	0.475

Table 2: Estimated probability of purchase for LCD television sets (all data 4500 and 3420 analyzed)

	Survey of 8 November 2010	Survey of 25 November 2010 (With actual monetary value)
Type		
LG, Screen 94, Hertz 50		
Cash	0.915	0.836
Versus 24 months payments	0.850	0.791
Cash	0.949	0.947
Versus maximum months payments	0.313	0.211

Table 3: Estimated probability of purchase for couches (all data 4500 and 3420 analyzed)

	Survey of 8 November 2010	Survey of 25 November 2010 (With actual monetary value)
Type		
Color gray, seat size 46, normal comfort		
Cash	0.761	0.741
Versus 24 months payments	0.685	0.726
Cash	0.873	0.882
Versus maximum months payments	0.271	0.146

Appendix: The questionnaire

The first wave of data was collected on November 8 2010 and the second wave on November 25 2010.

The text for the survey reads as:

We kindly ask you to cooperate with the following survey. This survey is about making choices in the purchasing process of a durable good, like television sets, audio equipment and other household appliances. In each question you can choose between two different products. The features of each product differ from each other, like brand of the product, screen size or price. For each question we ask you to draw a circle around the product you prefer.
Many thanks for your kind help.

LCD-TV

You want to buy an LCD-TV and on the internet you see various offers. Each question displays two products between which you can choose. For each choice set we ask you to draw a circle around the product you prefer.

Choice set 1

	# 1:	**# 2:**
Brand	Samsung	LG
Screen size	94	81
Hertz	50	50
Payment	€ 338,00 in cash	59 monthly payments of € 8,00

Choice set 2

	# 1:	# 2:
Brand	Samsung	Samsung
Screen size	94	81
Hertz	50	60
Price	€ 338,00 in cash	24 monthly payments of € 16,00

Choice set 3

	# 1:	# 2:
Brand	LG	Samsung
Screen size	81	94
Hertz	60	50
Price	24 monthly payments of € 16,00	59 monthly payments of € 8,00

Choice set 4

	# 1:	# 2:
Brand	LG	Samsung
Screen size	81	94
Hertz	50	60
Price	€ 439,00 in cash	73 monthly payments of € 9,00

Choice set 5

	# 1:	# 2:
Brand	LG	Samsung
Screen size	81	94
Hertz	50	50
Price	€ 439,00 in cash	24 monthly payments of € 21,00

Choice set 6

	# 1:	# 2:
Brand	LG	LG
Screen size	94	81
Hertz	50	60
Price:	24 monthly payments of € 21,00	73 monthly payments of € 9,00

On November 25 2010 we circulated the survey that is similar to the above, except that the order of choice sets has changed and that the prices are now all in Euro's.

Choice set 1

	# 1:	**# 2:**
Brand	LG	Samsung
Screen size	81	94
Hertz	50	60
Price	€ 439,00	€ 657,00

Choice set 2

	# 1:	**# 2:**
Brand	Samsung	LG
Screen size	94	81
Hertz	50	50
Price	€ 338,00	€ 472,00

Choice set 3

	# 1:	**# 2:**
Brand	LG	Samsung
Screen size	81	94
Hertz	50	50
Price	€ 439,00	€ 504,00

Choice set 4

	# 1:	**# 2:**
Brand	Samsung	Samsung
Screen size	94	81
Hertz	50	60
Price	€ 338,00	€ 384,00

Choice set 5:

	# 1:	# 2:
Brand	LG	LG
Screen size	94	81
Hertz	50	60
Price	€ 504,00	€ 657,00

Choice set 6

	# 1:	# 2:
Brand	LG	Samsung
Screen size	94	81
Hertz	60	50
Price:	€ 384,00	€ 472,00

References

Chen, Haipeng and Akshay R. Rao (2007), When two plus two is not equal to four: Errors in processing multiple percentage changes, *Journal of Consumer Research*, 34, 327-340.

Franses, Philip Hans and Anita Vlam (2011), Financial innumeracy: Consumers cannot deal with interest rates, Econometric Institute Report 2011-01, Erasmus University Rotterdam.

Lusardi, Annamaria and Olivia S. Mitchell (2008), Planning and Financial Literacy: How Do Women Fare? NBER Working Paper Series, Vol. w13750, Available at SSRN: http://ssrn.com/abstract=1087003

Paulos, John Allen (1988), *Innumeracy: Mathematical illiteracy and its consequences*, New York: Hill & Wang.